

WHAT IS TO BE CLAIMED:

1. A superconducting material comprising a structure wherein C₂₀ Fullerene molecules are polymerized into a one-dimensional chain.

2. A superconducting material according to claim 1, wherein C₂₀ Fullerene molecules are bound via sp³-bond.

3. A superconducting material according to claim 2, wherein no sp³-bond exists other than bonding portions between the C₂₀ Fullerene molecules.

4. A superconducting material according to claims 1, wherein the material having a structure obtained by injection of electrons or positive holes.

5. A superconducting material according to claims 2, wherein the material having a structure obtained by injection of electrons or positive holes.

6. A superconducting material according to claims 3, wherein the material having a structure obtained by injection of electrons or positive holes.

7. A method for producing a superconducting material, comprising the steps of:

incorporating and polymerizing C₂₀ Fullerene molecules in a porous material which has a large band gap between a
5 valence band and a conduction band;

mounting the porous material incorporating the C₂₀ Fullerene molecules on a semiconductor substrate doped with an acceptor or a donor; and
applying electric field to the porous material.

8. A method for producing a superconducting material according to claim 7, wherein the porous material having a large band gap is zeolite or a BN nanotube.